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(56) Documents Cited

GB 2291763 A **WO 96/24215 A1** **WO 94/21077 A1**
WO 92/10900 A1 **US 5583922 A**

(58) Field of Search

UK CL (Edition P) **H4K KFH**
INT CL⁶ **H04M 3/50 11/06**
ONLINE:WPI

(54) Abstract Title

Visually displaying computer telephony options at caller's telephone device

(57) Method and apparatus to allow the options (figure 4) provided by an auto-attendant 50 to be presented on a display of a caller's telephone device (32, figure 2) thus allowing the caller to select the required option without having to navigate through the verbal option menus provided by the conventional system. When a request for computer telephony options has been detected, the option menu is transmitted to the telephone display and the caller can select the desired option. The auto-attendant 50 is conditioned in accordance with the option selected and the call may be directed to the appropriate telephone 52. The request for options may be in the form of a sequence of DTMF signals and the options may be transmitted as text in ASCII that has been encoded via DTMF signals. The options are presented as text on the display (32, figure 2) and the caller may select the desired option either by entering a sequence of DTMF signals or by generating the sequence by highlighting and selecting the option using a mouse pointer or keyboard. The telephone device may be a telephone connected to a computer (figure 2) or may be a telephone with a built-in screen and DTMF receiver.

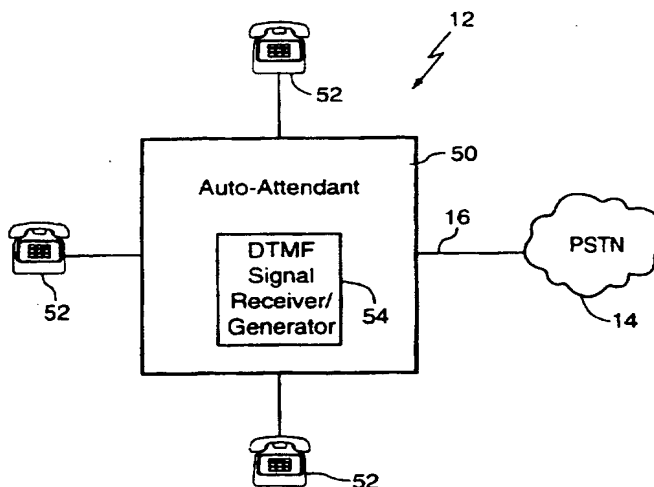


FIG.3

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

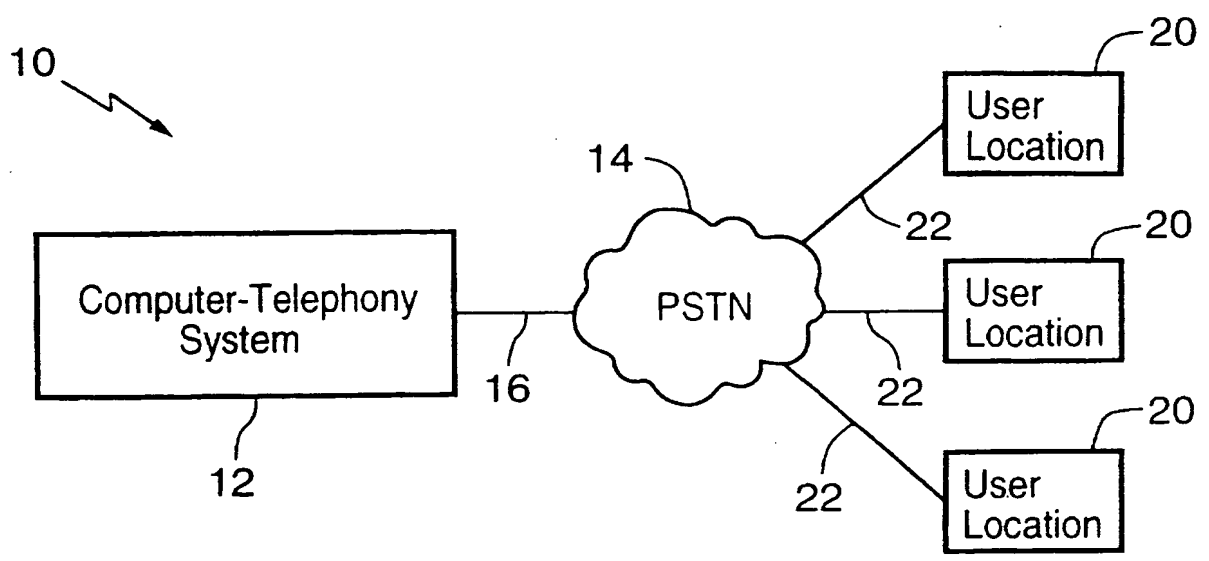


FIG. 1

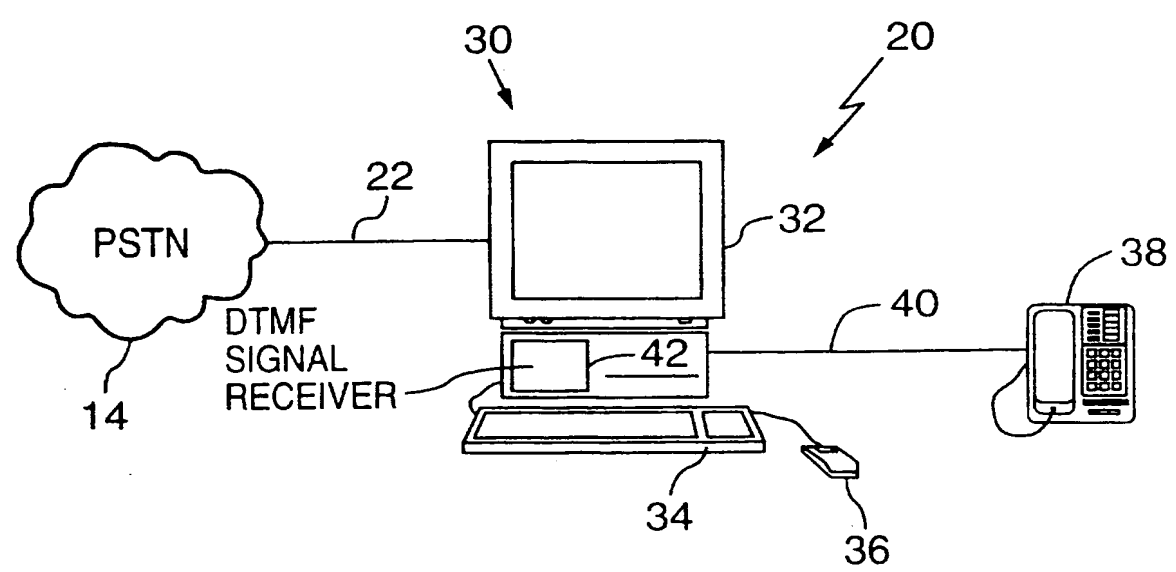


FIG. 2

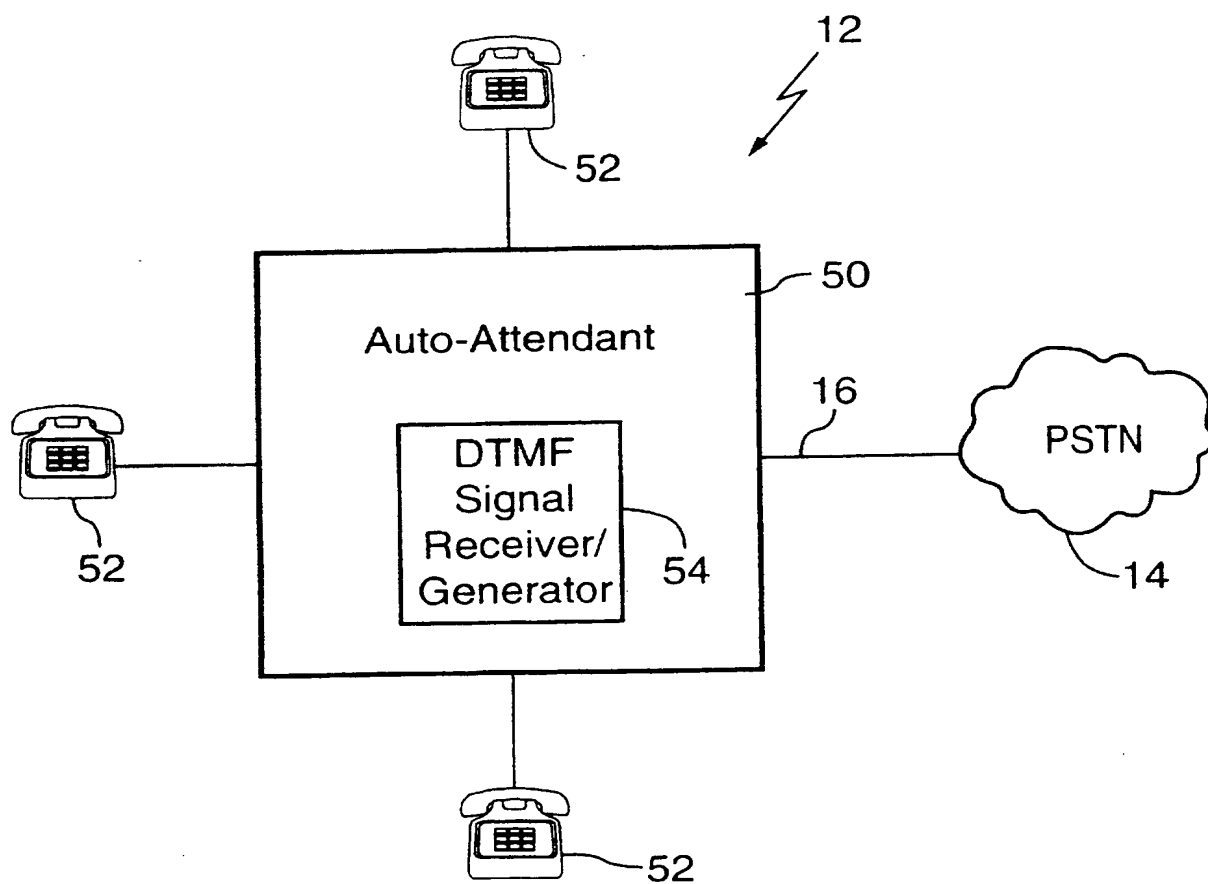


FIG.3

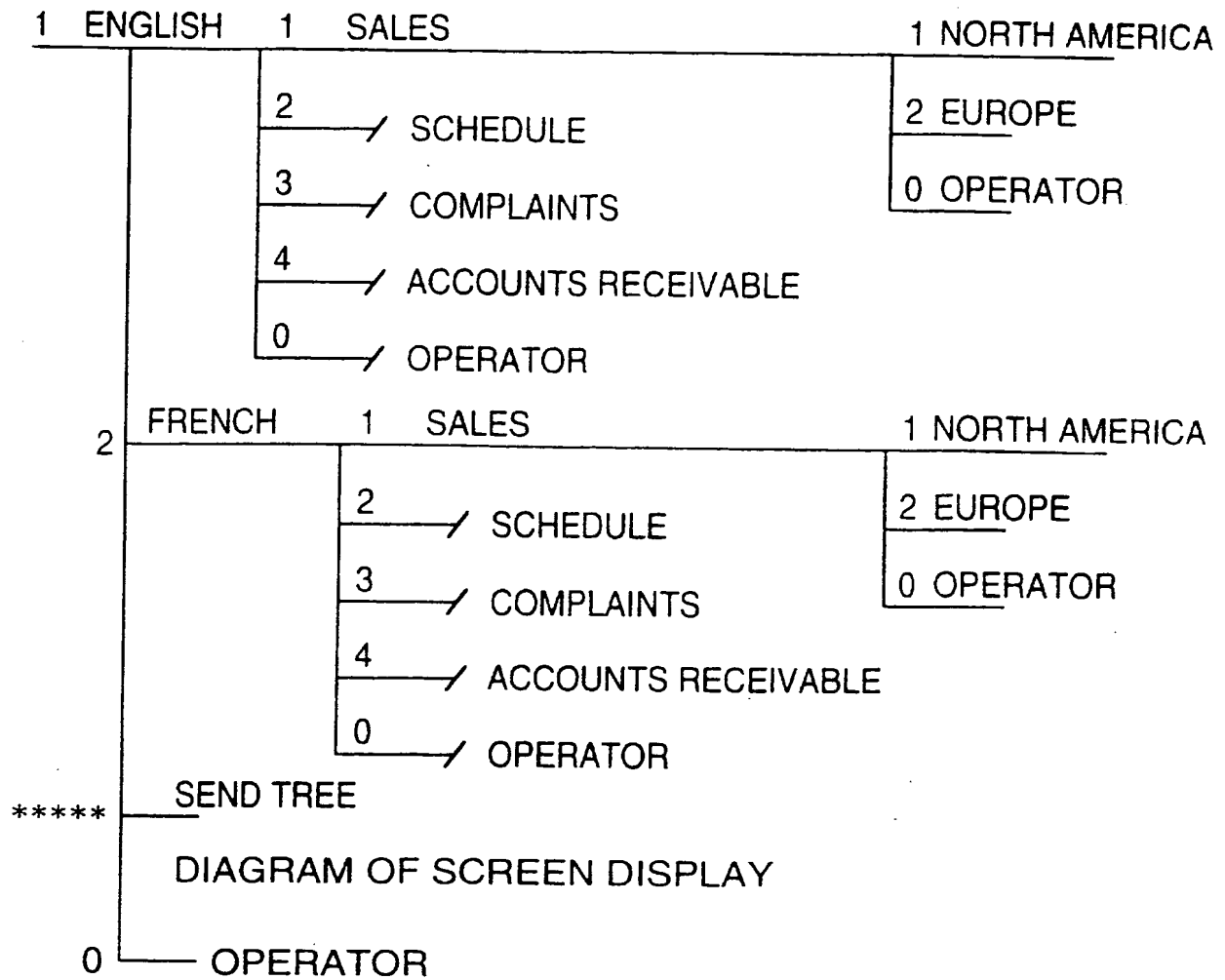


FIG.4

- ### ## → start of screen
- ### #* → pause (b. directional)
- ### *# → end

- ### ** → start of item
- ### ## → end of item
- *** ** → send screen

- ### ** → start of item
- 00.99 → level in tree
- 00.99 → level in branch
- 00.99 → DTMF activation digits
- Text ASCII coded in 2 digit DTMF free length
- ### ## → end of item

FIG.5

**METHOD AND SYSTEM FOR PRESENTING
COMPUTER-TELEPHONY OPTIONS**

Field Of The Invention

The present invention relates to telephony and in particular to a method and system for presenting computer-telephony options.

5 Background Of The Invention

Many businesses make use of computer-telephony systems having auto-attendants to answer incoming telephone calls. When an incoming telephone call is received, the auto-attendant presents the caller with a variety of options via dialogue. The caller after listening to the dialogue can select the desired option by
10 pressing the appropriate touch-tone key. To facilitate use, the dialogue is arranged in a convenient and logical manner consistent with knowledge of human psychology.

These computer-telephony systems save money by allowing a caller to direct their own telephone call without requiring the assistance of an employee of the business. Although this benefit exists it is offset by the many options typically
15 presented to callers and the fact that the options are conveyed by voice making the process slow and error prone. If a caller makes a mistake, the caller often must listen to many seconds of repeat dialogue resulting in caller frustration. Accordingly, improvements to computer-telephony systems of this nature are desired.

It is therefore an object of the present invention to provide a novel
20 method and system for presenting computer-telephony options.

Summary Of The Invention

According to one aspect of the present invention there is provided in a computer-telephony system having an auto-attendant to answer incoming telephone
25 calls, a method of presenting computer-telephony options to a telephone having an associated display after a telephone call has been answered, said method comprising the steps of:

monitoring said telephone to detect a request for computer-telephony options;

transmitting said computer-telephony options to said telephone for presentation on said display upon detection of said request;

monitoring said telephone to detect selection of one or more of said computer-telephony options; and

5 conditioning said auto-attendant in accordance with said one or more selected options.

 In a preferred embodiment, the request for computer-telephony options is in the form of a sequence of DTMF signals generated by the telephone. It is also preferred that the computer-telephony options are presented on the display as text. In
10 one embodiment, the text is transmitted from the computer-telephony system to the telephone via text encoded DTMF signals. In one embodiment, the selection of the one or more computer-telephony options is made via a sequence of DTMF signals or by highlighting text presented on the display.

 According to another aspect of the present invention there is provided a
15 communications system comprising:

 at least one telephone having an associated display; and

 a computer-telephony system having an auto-attendant to answer incoming telephone calls, said computer-telephony system including means for monitoring said at least one telephone to detect a request for computer-telephony
20 options; means for transmitting said computer-telephony options to said at least one telephone for presentation on said display upon detection of said request; means for monitoring said at least one telephone to detect selection of one or more of said computer-telephony options; and means for conditioning said auto-attendant in accordance with said one or more selected options.

25 The present invention provides advantages in that a caller does not have to wait until all options are presented verbally by the auto-attendant. Instead, the caller can request the computer-telephony system to transmit the complete menu of options for presentation on the display associated with the telephone allowing the caller to select one or more desired computer-telephony options without having to
30 navigate through the auto-attendant dialogue.

Brief Description Of The Drawings

An embodiment of the present invention will now be described more fully with reference to the accompanying drawings in which:

Figure 1 is a schematic of a communications system including a computer-telephony system having an auto-attendant and a plurality of remote user locations;

Figure 2 is a schematic of one of the user locations of Figure 1 including a telephone having an associated display;

Figure 3 is a schematic of the computer-telephony system shown in Figure 1;

Figure 4 is an illustration of computer-telephony options presented by the computer-telephony system of Figure 3; and

Figure 5 is a table of DTMF commands to which the computer-telephony system of Figure 3 responds.

Detailed Description Of The Preferred Embodiment

Referring now to Figure 1, a communications system is shown and is generally indicated to by reference numeral 10. Communications system 10 includes a computer-telephony system 12 connected to a public switched telephone network (PSTN) 14 via a trunk connection 16. A plurality of remote user locations 20 are also connected to the PSTN 14 via trunk connections 22 and include telephones to allow callers to establish telephone calls with the computer-telephony system 12 over the PSTN 14.

Figure 2 better illustrates one of the user locations 20. As can be seen, the user location 20 includes a personal computer 30 having a monitor 32, a keyboard 34 and a mouse pointer 36 operating in a well known manner. A telephone 38 is connected to the personal computer 30 by way of a universal serial bus (USB) 40. USB 40 includes a 12Mbit/s serial interface running over a 4 wire bus with an associated software stack supporting peripheral connectivity to the personal computer

30. A DTMF signal receiver 42 is also included in the personal computer 30 as well as software to convert DTMF signals to text for display on the monitor 32.

Computer-telephony system 12 is best illustrated in Figure 3 and is typically located at the premises of a business. As can be seen, computer-telephony system includes an auto-attendant 50 to answer incoming telephone calls received from user locations 20 over the PSTN 14 and to direct the incoming telephone calls to an appropriate telephone 52. As is well known the auto-attendant 50 presents a caller with the options via dialogue and prompts the caller to select options by pressing appropriate keys on a touch-tone telephone. A DTMF signal receiver/generator 54 within the auto-attendant detects pressed keys so that the auto-attendant 50 can process the incoming call in the manner selected by the caller. In addition to the above-described conventional operation, the auto-attendant 50 also transmits the complete menu of options to the caller for display on the monitor 32 upon receipt of a request from the caller as will be described.

Figure 4 illustrates the menu of options 60 available through the auto-attendant 50 which is normally presented to a caller through dialogue. As can be seen, in the first branch of the menu 60, a caller has the following options:

- (i) selecting the language the dialogue is to be presented (either English or French) by pressing a "1" or "2";
- (ii) requesting transmission of the menu of options 60 for display by pressing the DTMF signal sequence "* * * * *"; or
- (iii) requesting connection to an operator by pressing "0".

If the caller selects the language of the dialogue, the auto-attendant 50 enters a second branch and the caller is presented with more options via dialogue. Specifically, the caller has the following options:

- (i) selecting sales by pressing a "1";
- (ii) selecting complaints by pressing a "2"
- (iii) selecting accounting by pressing a "3"; or
- (iv) requesting connection to an operator by pressing "0".

If one of options (ii) to (iv) is selected, the auto-attendant 50 directs the incoming telephone call to the appropriate telephone 52 so that the incoming telephone call is answered by the proper party. If option (i) is selected, the caller is presented with
5 more options as follows:

- (i) selecting North America by pressing "1";
- (ii) selecting Europe by pressing "2"; or
- (iii) requesting connection to an operator by pressing "0".

Once one of these options has been selected, the auto-attendant 50 directs the
10 incoming telephone call to the appropriate telephone 52. This operation of the auto-attendant 50 is conventional.

If the caller requests transmission of the menu 60 for display by pressing the DTMF signal sequence "*****", the auto-attendant 50 transmits the menu as text in ASCII that has been encoded via DTMF signals to the user location
15 20. Since DTMF encodes digits 0 to F in hexadecimal and since ASCII encodes text letters as hexadecimal numbers from 00 to FF, each ASCII term is represented by 2 DTMF signals. When the user location receives the string of DTMF signals, the DTMF receiver 42 in the personal computer 30 detects the DTMF signals. Software executed by the personal computer 30 in turn converts the DTMF signals back into
20 ASCII and presents the menu as text on the monitor 32 so that the caller has all of the available options visible.

When the caller wishes to select an option, the caller enters a start of item sequence of DTMF signals of the form "# # # * *". Following this, the caller enters the DTMF signals corresponding to the desired level and branch in the menu.
25 For example, if the caller wants to select European sales in English from the menu 60, the caller enters the DTMF signal sequence "01, 01, 02" corresponding to the menu options "1" for English, "1" for Sales and "2" for Europe. Once this is completed, the caller enters an end of item sequence of DTMF signals of the form "# # # * # #".

The caller can also pause a session by entering the DTMF signal sequence "####*" as well as end a session by entering the DTMF signal sequence "####*#".

Alternatively, the caller can highlight and select the desired option
5 using the mouse pointer 36 or keyboard 34. In this case, the personal computer 30 generates the appropriate DTMF signal sequence.

When the auto-attendant 50 receives the DTMF signals from the user location, they are detected by the DTMF receiver generator 54. The auto-attendant in turn processes the DTMF signals and processes the caller's selected options so that
10 the caller is directed to the appropriate telephone 52 in the desired manner. As will be appreciated, a caller requesting the menu for display can select from the menu without having to listen to the dialogue of the auto-attendant 50 associated with the various levels and branches of the menu.

Although the menu 60 has been described as being transmitted to the
15 user location as ASCII text encoded via DTMF signals, those of skill in the art will appreciate that any conventional modem standard can be used to transmit the menu from the computer-telephony system to the personal computer.

In addition, although the user locations have been described as including a telephone connected to a personal computer via a USB, it will be
20 appreciated that the user locations can include telephones with built in displays and DTMF receivers to allow the text encoded DTMF signals to be decoded and displayed as text.

Those of skill in the art will also appreciate that variations and modifications may be made to the present invention without departing from the spirit
25 and scope thereof as defined by the appended claims.

We Claim:

1. In a computer-telephony system having an auto-attendant to answer incoming telephone calls, a method of presenting computer-telephony options to a telephone having an associated display after a telephone call has been established, said
5 method comprising the steps of:

monitoring said telephone to detect a request for computer-telephony options;

transmitting said computer-telephony options to said telephone for
10 presentation on said display upon detection of said request;

monitoring said telephone to detect selection of one or more of said computer-telephony options; and

conditioning said auto-attendant in accordance with said one or more selected options.

15

2. The method of claim 1 wherein said request is in the form of a predetermined sequence of DTMF signals.

3. The method of claim 2 wherein said computer-telephony options are
20 presented on said display as text.

4. The method of claim 3 wherein said text is transmitted from said computer-telephony system as text encoded DTMF signals.

25 5. The method of claim 4 wherein said text encoded DTMF signals represent ASCII.

6. The method of claim 2 wherein the selection of said one or more options is made via a sequence of DTMF signals.

30

7. The method of claim 2 wherein the selection of said one or more computer-telephony options is made by highlighting computer-telephony options presented on said display.
- 5 8. The method of claim 2 wherein the selection of said one or more computer-telephony options is made by highlighting computer-telephony options presented on said display and/or by a sequence of DTMF signals.
9. A communications system comprising:
10 at least one telephone having an associated display; and
a computer-telephony system having an auto-attendant to answer incoming telephone calls, said computer-telephony system including means for monitoring said at least one telephone to detect a request for computer-telephony options; means for transmitting said computer-telephony options to said at least one
15 telephone for presentation on said display upon detection of said request; means for monitoring said at least one telephone to detect selection of one or more of said computer-telephony options; and means for conditioning said auto-attendant in accordance with said one or more selected options.
- 20 10. A communications system as defined in claim 9 wherein said means for monitoring includes a DTMF signal detector to detect a predetermined sequence of DTMF signals.
11. A communications system as defined in claim 10 wherein said
25 computer-telephony system transmits said computer-telephony options as text.
12. A communications system as defined in claim 11 wherein said text is transmitted in the form of text encoded DTMF signals.

13. A communications system as defined in claim 10 wherein said selection detection means includes a DTMF signal detector to detect DTMF signals generated by said at least one telephone.



Application No: GB 9719709.9
Claims searched: 1-13

Examiner: Anita Keogh
Date of search: 16 February 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.P): H4K (KFH)
Int CI (Ed.6): H04M 3/50, 11/06
Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2291763 A (BELLSOUTH) see whole document	1-3, 6-11, 13
X	WO 96/24215 A1 (RADISH) see whole document, especially page 8	1 & 9 at least
X	WO 94/21077 A1 (MOMENTUM) see especially page 1, paragraph 2 and page 12, line 35 to page 13, line 17	1-13
X	WO 92/10900 A1 (ALHEIM) see whole document, especially pages 1-6	1-6, 8-13
X	US 5583922 (DAVIS et al.) see whole document, particularly column 3, line 6 to column 5, line 61 and column 11, line 59 to column 12, line 19	1 & 9 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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